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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/667,870 | 09/22/2003 | Francesco Coppola | TI-34641 | 1168 |

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| EXAMINER |
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CHANG, JOSEPH

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| ART UNIT | PAPER NUMBER |
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2817

DATE MAILED: 08/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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|------------------------------|------------------------|---------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/667,870 | COPPOLA ET AL. | |
| | Examiner | Art Unit | |
| | Joseph Chang | 2817 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 7-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 7 recites the limitation "the clock signal" in line 2 of page 5. There is insufficient antecedent basis for this limitation in the claim. And also the recitation "using a search at a predetermined control voltage; a desired frequency; " is not understandable.

Regarding claim 8, the recitation "The method of claim 1" is improperly recited because claim 1 is not a method claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Su et al. US Patent 6,404,289 B1.

Su et al. discloses a tuning circuit (Figures 2 and 5) and a method comprising: a voltage controlled oscillator (Figure 5) for generating a first clock signal (VCO output) comprising: an inductive element (pair of inductors); a variable capacitive element (pair of varactors) coupled to the inductive element; a bank of switched capacitors (510A-D) coupled to the inductive element and the variable capacitive element (col.6, lines 35-49); a frequency divider (Figure 8 in a PLL, Col.8, line 29) for generating a second clock signal (output of the divider, i.e. the divided VCO output) responsive to the first clock signal (VCO output) and a selected divisor (a divide-by-M by Channel Select, S in Figure 8, see Col. 8, line 29 - Col. 9 line 40); frequency control circuitry (phase detector, Col.3, line 4) for adjusting a control voltage to the variable capacitive element responsive to a frequency difference between the second clock signal (output of the divider) and a reference signal (f_{ref}) to oscillate the first clock signal (VCO output) at a desired frequency; and logic circuitry (state machine, Col. 6, line 51) for calibrating the voltage controlled oscillator (Figure 5, Col. 6, lines 35-49) to a frequency range inclusive of a new desired frequency responsive to a change in the divisor by (Col. 6, lines 50-61): performing a coarse search (initial search, Col. 6, line 53) at a predetermined control voltage ("the most appropriate control voltage V_c ", Col. 6, line 55) to determine an initial control word (Col. 6, lines 56-61); and testing the initial control word (Fig 6A) to determine whether the initial control word should be used to generate the first clock signal (VCO output) at the now desired frequency (614, "Yes") or whether the initial

control word should be changed to an adjacent control word (616, see Fig. 6A and Col. 6, line 62 - Col. 8, line 28 for in detail).

Claims 1, 3-7, 9-12 are rejected under 35 U.S.C. 102(e) as being anticipated by Adams et al. US Patent 6,686,804 B1.

Regarding claims 1 and 7, Adams et al. discloses a tuning circuit (Figures 4 and 7) and a method comprising: a voltage controlled oscillator (410, or 703) for generating a first clock signal (VCO output) comprising: an inductive element (inherently present in oscillator 602); a variable capacitive element (606) coupled to the inductive element; a bank of switched capacitors (604) coupled to the inductive element and the variable capacitive element (see Fig. 6); a frequency divider (414) for generating a second clock signal (output of the divider, i.e. the divided VCO output) responsive to the first clock signal (VCO output) and a selected divisor (N from 420 by freq. selection & control); frequency control circuitry (402) for adjusting a control voltage to the variable capacitive element responsive to a frequency difference between the second clock signal (output of the divider) and a reference signal (Ref) to oscillate the first clock signal (VCO output) at a desired frequency; and logic circuitry (416, 418 or 723, 737 of Fig. 7) for calibrating the voltage controlled oscillator (410) to a frequency range inclusive of a new desired frequency responsive to a change in the divisor by (Col. 5, lines 12-21): performing a coarse search (calibration process, Col. 5, lines 22-33) at a predetermined control voltage (min or max from 408) to determine an initial control word (the first fixed-value capacitor selection); and testing the initial control word to determine whether the initial

Art Unit: 2817

control word should be used to generate the first clock signal (VCO output) at the now desired frequency or whether the initial control word should be changed to an adjacent control word (inherent functionality during tuning process, Col. 5, lines 34-49).

Regarding claims 3 and 9, Adams et al. discloses the logic circuitry (416, 418) testing the initial control word by comparing the desired frequency to upper (max) and lower (min) bounds of a frequency range for the voltage controlled oscillator while configured according to the initial control word (Col. 5, lines 22-49).

Regarding Claims 4 and 10, Adams et al. discloses the logic circuitry (721, 737) determine the initial control word using fast comparisons between an actual frequency at the predetermined control voltage and the desired frequency and determines whether the initial control word should remain the same by using more precise comparisons between the actual frequency and the desired frequency (the functional limitation inherently present in the structure because the circuit of Adams et al. is substantially the same as the one in this application).

Regarding Claims 5 and 11, Adams et al. discloses the logic circuitry (721, 737) tests the initial control word by determining whether the difference between the desired frequency and an actual frequency for the VCO while configured according to the initial control word is within a predetermined threshold (the functional limitation inherently present in the structure because the circuit of Adams et al. is substantially the same as the one in this application).

Art Unit: 2817

Regarding Claims 6 and 12, Adams et al. discloses an indication (look-up table, Col. 6, lines 9-18) of the actual frequency being determined by counting clock cycles from the voltage-controlled oscillator in a frequency divider circuit.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Su et al.

As discussed above rejection, Su et al. discloses calibrating a VCO except the accuracy that is greater than or equal to +/- least significant bit of the initial control word.

As would have been recognized by one of ordinary skill in the art, such value of the accuracy would have been obvious for a mere optimization value.

Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adams et al.

As discussed above rejection, Adams et al. discloses calibrating a VCO except the accuracy that is greater than or equal to +/- least significant bit of the initial control word.

As would have been recognized by one of ordinary skill in the art, such value of the accuracy would have been obvious for a mere optimization value.

Response to Arguments

Applicant's arguments with respect to claims 1-12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Chang whose telephone number is 571 272-1759. The examiner can normally be reached on Mon-Fri 0700-1730.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2817

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Joseph Chang
Patent Examiner
Art Unit 2817